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# PUBLIC HEALTH REPORTS

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## SOME CHILD HYGIENE ACTIVITIES OF THE UNITED STATES PUBLIC HEALTH SERVICE.

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The functions of the United States Public Health Service may be described under the following headings:

1. Protection of the United States from the introduction of disease from without.
2. Prevention of the interstate spread of disease and suppression of epidemics.
3. Cooperation with State and local boards of health in health matters.
4. Investigation of diseases of man.
5. Supervision and control of biological products.
6. Public health education and dissemination of health information.

In the exercise of these functions, in cooperation with State and local health authorities, the work of the Public Health Service has contributed very largely to the gradual decline in the general mortality rate of the country, which has been accompanied by a parallel reduction in the infant mortality rate. In other words, the United States Public Health Service, through efforts organizing better public health administration, improving the domestic and civic environment of the people, and through the wide dissemination of public health information, has been no small factor in reducing the infant mortality rate, which for a number of years has steadily declined, even without special attention to child health problems. In fact, even at the present time, as compared with the country at large, only a small part of the infant population enjoys the benefits of specialized health supervision.

### Child Health Supervision.

In addition to the exercise of its general health functions on an increasingly broad scale, the Service has given attention to individual health problems and to the health needs of special classes of the population. In this connection, with special reference to safeguarding the health of infants and children, the Service in 1908 published a

bulletin on "Milk in Relation to Public Health." This publication contained many articles relating to milk as an infant's food and, in addition, special articles relating to infant feeding, morbidity, and mortality. This bulletin was widely distributed and contributed materially to the adoption by State and local health officials of measures for safeguarding the milk supply, one of the most important factors in the control of tuberculosis among children, and in reducing the morbidity and mortality rates due to the diarrheal diseases of children.

#### EPIDEMIOLOGICAL STUDIES.

In 1912 the Public Health Service, impressed by reports of the prevalence of trachoma in certain parts of the country, and mindful of the high incidence of this disease potentially so damaging to vision in children, inaugurated surveys to map out the areas of infection preparatory to the institution of measures of control. Owing to the fact that representatives of practically every family in the community attend school, these investigations were largely confined to examinations of school children. In the years 1912 to 1914, both inclusive, officers of the United States Public Health Service visited over 1,000 schools in 11 States and examined 170,491 school children, of which number 2,425, or 1.42 per cent, were found to be suffering from trachoma.

As a result of these surveys, in addition to measures adopted by the States and communities, the Public Health Service established seven special hospitals for the treatment of trachoma and has treated in them up to June 30, 1921, 9,168 cases. In addition, largely as an educational measure in methods of control, Service officers have held 158 clinics in the several States, where 29,770 cases of trachoma received 296,920 treatments, and where 10,378 operations were performed on cases amenable to surgical relief. The far-reaching effect of these measures on child health and efficiency, through the preservation and restoration of vision in individual cases and the improvement in the economic status of whole families in heavily infected communities can scarcely be estimated. Furthermore, the educational value of the medical and surgical measures adopted for the control of this disease to the communities at large stamps this as one of the great child hygiene movements of this country.

#### SCHOOL HYGIENE.

In the course of the epidemiological studies mentioned, the officers of the Service were instructed to make sanitary surveys of the school buildings visited by them and observations of the physical condition of the children inspected. As a result of these observations it became apparent that organized health work in schools had been largely confined to the cities and that the work should be extended to country

districts, where so many people reside without receiving instruction in the prevention of disease.

The sanitary needs revealed were many. In general, the faults observed were due to lack of skilled advice and assistance and concerned especially the health supervision of children and the location, construction, sanitation, and equipment of school buildings.

In order to secure material for the standardization of the work and for the purpose of focusing attention more particularly on school health supervision, in 1915 the Service made a survey of the rural schools of Porter County, Ind., in cooperation with the local health and educational authorities. During this survey exhaustive studies were made of the hygiene of 75 rural schools, and a medical and mental examination was made of 2,488 school children. This work has been continued, and up to the end of 1921 the Service had made sanitary surveys of hundreds of school buildings and examined large numbers of school children in nearly every State of the Union. The work of the Service in this field has attracted nation-wide attention and has contributed very materially to the advancement of school health supervision, especially in rural districts, where such service is so badly needed.

Based on the data collected in the course of these surveys and mindful of the relation of the child to the community in matters of health, the Service has devised a schedule for school health supervision which has been adopted, with only such modifications as were required by local condition, by six States. In addition, the Service has received local requests from practically every State for assistance in preparing or supplying these schedules.

#### MENTAL HYGIENE.

The studies of the child's school environment and his physical condition revealed the fact that both the health and educational authorities had been very lax in determining the mental status of the children attending school. On the basis of these observations, the Service undertook special studies of the mental status of children, with particular reference to the prevalence of feeble-mindedness and allied conditions. In the course of these studies there was made a mental survey of 50,630 children in 663 schools and 10 institutions in 10 States and the District of Columbia, and it was found that the percentage of feeble-mindedness in the school population of the communities visited ranged from 0.3 per cent to 1.3 per cent of those examined. Furthermore, as indicated by these examinations, it appears that the percentage of feeble-mindedness in the schools approximated that in the general population represented by individuals 5 to 20 years of age, inclusive, where the school attendance was not less than 80 per cent of the total enrollment. These studies also

indicate that the percentage of mental defectives in the school population is double that in the general population.

The work of the Public Health Service in this field has strongly supplemented the work of others in focusing attention on the problem of feeble-mindedness and the necessity of State provision for the care and training of this unfortunate class of the population.

In Arkansas, the work of the Service in determining the prevalence of feeble-mindedness in the State served as the basis of recommendations to the legislature which resulted in the establishment of an institution for the care and training of the feeble-minded. Formerly no such provision had been made. In the course of this survey the Service representative visited 51 rural schools in 13 counties, and 20 schools in 8 cities, and examined 16,913 children.

In Oregon, the Public Health Service, cooperating with the University Extension Division of the University of Oregon conducted a State-wide survey to determine the prevalence of dependency and feeble-mindedness in that State. This survey was undertaken by the University of Oregon, in compliance with a resolution of the State legislature. It was found that of a population of 783,285, the total number of cases of mental defect was 3,702, or 0.47 per cent of the general population.

The combined total of all the known insane and all known mental defectives, with the approximate number of mental defectives among all delinquents and all dependents, was 7,689, or 0.98 per cent of the general population.

The total number of actual and potential social liabilities was 65,423. Excluding half of the delinquents and half of the dependents, there remains a total of 45,574 persons, representing 5.8 per cent of the general population.

Excluding further the known cases of insanity, the known cases of grosser mental defect in communities and institutions, and, further, excluding one-half of the delinquents as petty offenders, and one-half of the dependents as probably remedial, there was found 29,847 individuals who, as delinquents and dependents, were socially inadequate. In other words, the larger part of all public expenditures for the relief, care, treatment, and training of misfits of the State was caused by 3.8 per cent of the inhabitants. The report of this survey served as the basis of recommendation to the legislature for more adequate provision for these classes of the population.

This survey represents the first attempt at the conduct of a survey by the people themselves under trained direction, and has demonstrated conclusively the feasibility of making a survey in this manner with practical results at a minimum expense.

In addition to its other work in the field of mental hygiene, the Service undertook, in 1920, at the request of the judge of the Juvenile

Court of the District of Columbia, studies of the mental and physical status of children appearing before that court. These studies have not only given greater insight into the psychology of the delinquent class, but have been of the greatest value to the court in arriving at judicial decisions. Furthermore, these studies have revealed a rather high degree of venereal infection in this class of the population, as well as a number of other conditions requiring medical attention, with the result that steps are now being taken to secure medical and surgical relief for those who can not have the necessary attention otherwise. Furthermore, the work of the Public Health Service in this field has served as the basis of recommendation to Congress for the provision of a permanent service of this character in the Juvenile Court.

#### CHILD HEALTH ORGANIZATION.

It matters not how great our knowledge may be of the causes of infant mortality, and of the methods of control, this knowledge is useless without a perfected machinery for its practical application. Realizing as it does that heretofore the great factor in reducing infant mortality has been the improved organization of public health administration, the Service has made an intensive study of child health organization in seven States. The results of these studies have been very gratifying. In one State, in which no money had previously been appropriated for child health work and but limited appropriation made for general health work, the activities of the Service excited State-wide interest to such a degree that very liberal appropriations have been made not only for general health work but for child health work also. Some of the concrete results attained were the appointment of a full-time director of child hygiene, the establishment of public health nurses in 29 counties, the organization of child health centers in 23 counties, the distribution of thousands of school inspection schedules and the undertaking of some form of school health supervision in approximately 50 counties of the State, and the enactment of a physical education law which provides for the teaching of health habits and for the physical examination of school children and definitely coordinates the department of education and the State department of health in their relation to the health supervision of school children. In addition, volunteer organizations engaged in health work have been stimulated to greater activity and impressed with the value of coordinated effort.

In another State the appropriations for child health work, largely through the activities of the Service, have doubled; and in another, the child health work has been planned and organized on a three-year basis, at the termination of which period it is expected that the major portion of the child population of the State will be under definite health supervision. These results indicate that this work

is of the greatest magnitude and importance from the standpoint of child health protection.

### Research.

#### DRIED-MILK POWDER IN INFANT FEEDING.

The apostles of preventive medicine have emphasized the importance of breast feeding in giving children the best start in life and in reducing the infant mortality rate. However, many factors contribute to making breast feeding impossible, undesirable, or neglected in an unfortunately large number of instances, and recourse must be had to substitutes. Experience and the best medical judgment have confirmed the use of cow's milk as generally the best and most practical substitute for mother's milk. Unfortunately, over large areas of the country, cow's milk is not produced locally in sufficient quantity to supply the local needs. In other sections of the country it is produced in such quantity that much of it goes to waste, because of the cost of transportation or the lack of transportation facilities, and the distance limit that milk may be transported without deterioration. It is for these reasons that inquiring minds have turned to the solution of the problem and sought to make generally available this valuable food product at reasonable cost. As a result, the dried-milk products are coming into wider and wider use.

The value of these products as food for infants and older children has been demonstrated over and over again. However, except in institutional cases, no study of any magnitude had ever been undertaken in this country to establish the usefulness and safety of dried milk as an exclusive food for infants until that undertaken by the United States Public Health Service in August, 1919, in the city of Boston, Mass.

A total of 319 infants were enrolled for this study during the period August, 1919, to October, 1920. Of this number, 241 were under observation for sufficient length of time to furnish reliable data. The infants included in the study were not specially selected, but represented every type physically, and were recruited from all sorts and conditions of homes. The requirements for selection were that the infant should be entirely artificially fed, not more than six months old, and under the supervision of the Boston Baby Hygiene Association, which cooperated with the Service in this study. For purposes of study they were divided into three groups:

- Group I (control group), children fed on grade A market milk;
- Group II, children placed on whole milk powder (containing  $3\frac{1}{2}$  per cent butter fat; reconstituted in the home);
- Group III, children placed on milk which had been reconstituted from unsalted butter and skim milk powder.

The results of this study indicate that dried milk powder, of the brand used, is safe and of value as food for infants, and that it has some points of advantage in the case of babies who do not digest fresh cow's milk well. It was shown that the control infants in Group I made an average gain in weight less than that of the babies in either Group II or III, which were fed on dried milk products. In view of the fact that approximately four bottle-fed babies die to one fed at the breast, because of the use of improper substitutes, these studies of the Public Health Service point the way to a material lowering of the infant mortality rate from intestinal causes, by a wider use of the dried milk products in communities where pure fresh milk is not available.

#### **Studies of the Relation of Physical Handicaps to the State of Nutrition.**

During the latter part of the fiscal year 1921, 200 underweight children in Baltimore, Md., having one or more physical defects, were selected for the study of the effect of the correction of physical defects on growth and developments. The defects included decayed teeth, diseased tonsils, adenoids, and marked defects of hearing and vision. The defects were corrected in 153 of these children. An unlooked-for development of this study was a ramification from points of contact with the community, which resulted in the correction of defects in 67 children outside of the group studied.

The children included in this study were weighed at frequent intervals, both before and subsequent to the date of the correction of the physical defects, and were given no other special attention. With but one exception, every girl, after the correction of physical defects, gained at a more rapid rate than the normal average. This was also true of the boys from 8 to 12 years of age. This investigation furnished an important link in the evidence pointing to the hampering effect of physical defects on growth and development, and the benefits to be gained by their correction in childhood, even when other important welfare measures are neglected or not enforced.

#### **MOUTH HYGIENE.**

Paralleling studies of the relation of physical handicap to nutrition, during 1920 and 1921 the Public Health Service studied the mouth condition of over 15,000 children, in five States, with a view to determining the effect of dental decay and mouth sepsis on growth, development, and school progress, and, incidentally, to stimulate communities to provide dental facilities for the school children who are without them. The results of this latter phase of the work have been most gratifying. Not only have a number of local communities established or agreed to establish such facilities, but in



each State visited the State dental society has heartily indorsed the movement and is enlisting the gratuitous aid of the local dentists where communities are financially unable to carry on the work unassisted.

Decayed teeth and septic mouth conditions constitute a large majority of the defects observed in children of school age. Owing to the great number of children who suffer from these conditions, and the frequent harmful effect of such conditions on the physical well-being and school progress of the child, and the promptness with which tangible results of corrective work become evident, this work of the Public Health Service stands in the first rank of measures for the conservation of the health of children.

#### **Studies of Growth and Development.**

Different observers have reported from 30 to 70 per cent of the children examined by them as undernourished. The present generally accepted measure of nutrition is based on the standard standing height and weight for a given sex at a given age period. Several different standards of normal physical development are in use in this country which are based on very inconclusive data. In fact, at the present time, with but one exception, no such standard has been scientifically determined.

The effect on human growth and development, of wide geographical range and varying climatic conditions which affect the food supply, the varying densities of population, the different degrees of congestion of industrial operations and the different types of industries of different States and communities, the wide variation in the economic and social status of individual families, and the tremendous foreign immigration must be considered and makes it difficult to determine a standard of measurement which will be applicable to the whole country. It is possible that standards can be arrived at applicable only to certain sections of the country of more or less homogeneous population and uniform climate.

The Public Health Service is approaching this problem from a new angle and is collecting data on the growth and development of children of a given sex at different age periods, of native American stock, of native-born children of foreign-born parents according to racial stock, and of foreign-born children. These studies are being made on a large scale, and material will be collected in representative districts of the whole country in the attempt to supply the long-felt need of a reliable index of nutrition.

#### **STANDARDIZATION OF THE COLLECTION OF FIELD DATA.**

The Public Health Service has long felt the need of comparable data relating to child health in different sections of the country. The basic principles of child health work are well known, and certain

fundamental information relating to child health is desired and secured by practically all interested health agencies. Unfortunately, this information is largely collected in such manner, depending on the different agencies and individual workers, that it is difficult and well-nigh impossible to compare the data collected in one section of the country with that collected in another. The Public Health Service has prepared schedules which are in extensive use for recording data relating to prenatal care and the care of infants and children of pre-school age, for mouth hygiene, and for school health supervision work, with the object in view of using these forms as points of departure in the preparation of standard forms, in cooperation with the various health agencies of the country, that may be acceptable to all of them. By the use of such standards it will be possible to make comparisons and to utilize material collected in any section of the country for the evaluation of the effect of varying conditions and of special control measures on child health.

#### HEALTH EDUCATION.

The Public Health Service has prepared and distributed over 100 special articles having more or less direct bearing on child health. In addition to this, representatives of the Public Health Service, while conducting State-wide investigations in child hygiene, prepared much of the child health literature used by the States in which the investigations were conducted. Furthermore, during the year 1920, with the cooperation of 105 daily newspapers with wide circulation in practically every State in the Union, the Service published a series of articles on the "Care of the Baby" and another on "The Growing Child." These articles excited wide interest and were supplemented by hundreds of letters written in response to inquiries stimulated by them.

#### Present Work.

At the present time the Public Health Service is engaged in child health work in six States and will extend the work to include six other States. The plans of the Service contemplate investigations of every phase of child health conservation directed in such manner as to leave a permanent child health organization supported by the State or locality. Special investigations in individual States are made only in cooperation with State health authorities, on request, or with special agencies in any definite piece of child health investigation, indorsed by the State health authorities.

One of the remarkable features of the work of the Public Health Service is the small cost, which was made feasible by the type of organization. The total expenditure of special funds for child health work to the beginning of the fiscal year 1922, was \$66,000. The

relatively great amount of child health work by the Public Health Service was made possible by the ability of the Service to utilize not only its trained personnel in child hygiene work in connection with their regular duties in other fields of public health, but also the trained personnel of State and local health agencies and auxiliary volunteer agencies. Such procedure is both feasible and economical because of the intimate interrelationship of all health problems.

### DIPHTHERIA IN THE UNITED STATES.

The accompanying table shows the number of reported cases of diphtheria per 1,000 population by quarters, from January to June, and by months, from July to October, 1921, compared with the same periods during 1920, and the medians for 1913 to 1920, inclusive.

The median was ascertained by arraying the figures so that the greatest number was first, the next smaller number was second, and so on to the smallest number, which was placed last. The middle number of the array was then selected as the median. Data were not available for all the States for the full eight years. As many years as possible were included for each State, but no year earlier than 1913 was used. The first column shows the number of years for which figures were obtained for each State.

The estimated populations on which the rates were computed are as follows:

	Number of States.	Estimated population.
1921.....	41	90,907,540
1920.....	40	87,602,619
Median, 1913-1920.....	39	85,489,347

For comparison the death rates per 100,000 population in the registration area for deaths are shown in the following table:

*Diphtheria death rates per 100,000 population in registration area for deaths 1913-1920, inclusive.*

1920.....	15.3	1915.....	15.7
1919.....	14.7	1914.....	17.9
1918.....	13.9	1913.....	18.9
1917.....	16.6		
1916.....	14.5	Median.....	15.5